Subtilisin Structure-Function Correlation

Thermostability Motifs

FIG 2A

Subtilisin Structure-Function Correlation

Thermostablility Motifs

	70	80	90	100	110	120	130
Majority	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD						

3a3.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
6g6.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
4c6.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
3b3.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
3e2.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
6h9.seq	WAATNNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
3a7.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
5b11.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
4d10.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
1f6.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSQGVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
4c2.seq	WAAANNMHIANNSLGSDAPSTTLERAVNYATSRDVLVIAATGNNGSGSVGYPARYANAMAVGATD	361
Savinase.seq	WAGNNGMHVANLSLGSPSPSATLEQAVNSATSRGVLVVAASGNSGAGSISYPARYANAMAVGATD	388

FIG 2B

Subtilisin Structure-Function Correlation

Thermostablility Motifs

	140	150	160	170	180	190	
Majority	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK - - - - - -						
3a3.seq							
4g6.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYVSMSGTSMATPHVAGAAALVK						523
4c6.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGGQYAELSGTSMASPHVAGAAALVK						523
3b3.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLSGTSMATPHVAGAAALVK						523
3e2.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK						523
6h9.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK						523
3a7.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK						523
5b11.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYVSMNGTSMATPHVAGAAALVK						523
4d10.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYVSMNGTSMATPHVAGAAALVK						523
1f6.seq	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYVSMNGTSMATPHVAGVAALVK						523
4c2.seq	QNNRRASFSQYGTGIDIVAPGVNVQSTYPGNRYVSMNGTSMATPHVAGVAALVK						523
	QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLSGTSMATPHVAGVAALVK						523
Savinase.seq	QNNRRASFSQYGAGLDIVAPGVNVQSTYPGSTYASLNGTSMATPHVAGAAALVKQKNPSWSNVX						590

FIG 2C

Subtilisin Structure-Function Correlation

pH Shifting Motifs

76

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                          10        20        30        40        50        60
Majority    GASFVPGEPST QDGNGHGTHVAGTIAALDNSEGVLGVAPNADLYAVKVLGASGSGSISGIAQGLE

5e1.seq     ..........STQDGNGHGTHVAGTIAALDNDEGVVGVAPNADLYAVKVLSASGSGSISSIAQGLE  166
6a4.seq     ..........STQDGNGHGTHVAGTIAALDNDEGVVGVAPNADLYAVKVLSASGSGSISSIAQGLE  166
9b4.seq     ..........STQDGNGHGTHVAGTIAALDNDEGVVGVAPNADLYAVKVLSASGSGSISSIAQGLE  166
-1c10.seq   ..........STQDGNGHGTHVAGTIAALDNDEGVVGVAPNADLYAVKVLSASGSGSISSIAQGLE  166
7a2.seq     ..........STQDGNGHGTHVAGTIAALDNDEGVLGVAPNAELYAVKVLGASGSGSISGIAQGLE  166

4d7.seq     ..........STQDGNGHGTHVAGTVAALDNSVGVLGVAPEADLYAVKVLSASCAGSISSIAQGLE  166
6b6.seq     ..........STQDGNGHGTHVAGTIAALNNSIGVLGVAPNAELYAVKVLGAPGPGSVSGIAQGLE  166

6o6.seq     ..........STQDGNGHGTHVAGTVAALNNSIGVIGVAPSADLYAVKVLGANGRGSVSGIAQGLE  166
7c6.seq     ..........STQDGNGHGTHVAGTIAALNNSIGVVGVAPNADLYAVKVLGANGRGSVSGIAQGLE  166
6b11.seq    ..........STQDGNGHGTHVAGTIAALNNSIGVLGVAPNAELYAVKVLGASGSGSISGIAQGLE  166

Savinase.seq GASFVPGEPST QDGNGHGTHVAGTIAALNNSIGVLGVAPSAELYAVKVLGASGSGSVSSIAQGLE  190
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FIG 2D

Subtilisin Structure–Function Correlation

pH Shifting Motifs

	70	80	90	100	110	120	130	
Majority	W A G E N G M H I A N L S L G S S A P S A T L E Q A V N Y A T S Q G V L V I A A S G N S G A G S V G Y P A R Y A N A M A V G A T D							
5e1.seq	W S G E N G M D I A N L S L G S S A P S A T L E Q A V N A A T S R G V L V I A A S G N S G A G S V G Y P A R Y A N A M A V G A T D								361
6a4.seq	W S G E N G M D I A N L S L G S S A P S A T L E Q A V N A A T S R G V L V I A A S G N S G A G S V G Y P A R Y A N A M A V G A T D								361
9b4.seq	W S G E N G M D I A N L S L G S S A P S A T L E Q A V N A A T S R G V L V I A A S G N S G A G S V G Y P A R Y A N A M A V G A T D								361
1c10.seq	W S G E N G M D I A N L S L G S S A P S A T L E Q A V N A A T S R G V L V I A A S G N S G A G S V G Y P A R Y A N A M A V G A T D								361
7a2.seq	W A A A N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G G S V G Y P A R Y A N A M A V G A T D								361
4d7.seq	W S A A N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G G S V G Y P A R Y A N A M A V G A T D								361
6b6.seq	W A A A N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G G S V G Y P A R Y A N A M A V G A T D								361
6g6.seq	W A A A N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G G S V G Y P A R Y A N A M A V G A T D								361
7c6.seq	W A A A N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G G S V G Y P A R Y A N A M A V G A T D								361
6b11.seq	W A A A N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G G S V G Y P A R Y A N A M A V G A T D								361
Savinase seq	W A G N N G M H V A N L S L G S P S P S A T L E Q A V N S A T S R G V L V V A A S G N S G A G S I S Y P A R Y A N A M A V G A T D								188

FIG 2E

Subtilisin Structure-Function Correlation

pH Shifting Motifs

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                140        150        160        170        180        190
Majority   QNNRASFSQYGAGLDIVAPGVGVQSTYPGNRYASLNGTSMATPHVAGVAAALVKQKNPSWSNVX

5e1  seq   QNNRASFSQYGAGLDIVAPGVGVQSTYPGNRYASLNGTSMATPHVAGAAALVK              523
6a4  seq   QNNRASFSQYGAGLDIVAPGVGVQSTYPGSTYASLNGTSMATPHVAGVAALVK              523
9b4  seq   QNNRASFSQYGAGLDIVAPGVGVQSTYPGSTYASLNGTSMATPHVAGVAALVK              523
1c10 seq   QNNRASSSQYGAGLDIVAPGVGVQSTYPGNRYASLNGTSMATPHVAGVAALVK              523
7a2  seq   QNNRRANFSQYGIDIVAPGVEIESTYPGS[S]Y[D]S[R]GTSMATPHVAGAAALVK          523
4d7  seq   QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGVAALVK             523
6b6  seq   QNNRASFSQYGAGLDIVAPGVNVQSTYPGSTY[D]SLSGTSMATPHVAGVAALVK            523
6g6  seq   QNNRRANFSQYGTGIDIVAPGVNVQSTYPG[GQ]YAE[LSGTSMA][S]PHVAGAAALVK       523
7c6  seq   QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGVAALVK             523
6b11 seq   QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGVAALVK             523

Savinase seq   QNNRASPSQYGAGLDIVAPGVNVQSTYPGSTYASLNSTSMATPHVAGAAALVKGKNPSWSNVX   580
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FIG 2F

Subtilisin Structure-Function Correlation

Activity in DMF Motifs

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Majority      GASFVPGEPSTQDGNGHGTHVAGTIAALNNSIGVLGVAPNADLYAVKVLGANGSGSVSGIAQGLE
                       10        20        30        40        50        60

3dl1 seq      -------STQDGNGHGTHVAGTVAALNNSIGVIGVAPSADLYAVKVLGANGSGSVSGIA[R]GLE 166
2b8 seq       -------STQDGNGHGTHVAGTVAALNNSIGVIGVAPSADLYAVKVLGANGRGSVSGIA[R]GLE 166
2b4 seq       -------STQDGNGHGTHVAGTVAALNNSIGVIGVAPSADLYAVKVLGANGRGSVSGIAQGLE 166
2g6 seq       -------STQDGNGHGTHVAGTVAALNNNVGVLGVAPN[VE]LYG VKVLGANGSGSISGIAQGLQ 166
3g9 seq       -------STQDGNGHGTHVAGTVAALNNSIGVIGVAPSADLYAVKVLGANGRGSVSGIAQGLE 166
5f4 seq       -------STQDGNGHGTHVAGTIAALNNSIGVLGVAPNADLYAVKVLGANGSGSVSGIA[R]GLE 166
9e3 seq       -------STQDGNGHGTHVAGTIAALNNNVGVLGVAPN[VE]LYG VKVLGASGSGSISGIAQGLQ 166
1c4 seq       -------STQDGNGHGTHVAGTIAALNNSIGVIGVAPSADLYAVKVLGANGRGSVSGIAQGLE 166
8c2 seq       -------STQDGNGHGTHVAGTIAALNNSIGVLGVAPNAELYAVKVLGANGRGSVSGIAQGLE 166
8h2 seq       -------STQDGNGHGTHVAGTIAALNNSIGVLGVAPNADLYAVKVLGANGSGSVSGIA[R]GLE 166

Savinase seq  GASFVPGEPSTQDGNGHGTHVAGTIAALNNSIGVLGVAPSAELYAVKVLGASGSGSVSSIAQGLE 193
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FIG 2G

Subtilisin Structure–Function Correlation

Activity in DMF Motifs

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                  70          80          90         100         110         120         130
Majority   W A A A N N M H I A N M S L G S D A P S A T L E Q A V N Y A T S R G V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D

3d11 seq   W A A T N N M H I A N M S L G S D F P S T L E R A V N Y A T S R D V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361
2b8 seq    W A A A N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361
2b4 seq    W A A A N N M H I A N M S L G S D A P S T T L G R A V N Y A T S Q G V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361
2g6 seq    W A G N N G M H I A N M S L G T S A P S A T L E Q A V N A A T S R G V L V I A A S G N G A G S V G Y P A R Y A N A M A V G A T D 361
3g9 seq    W A A A N N M H I A N M S L G S D F P S T L E R A V N Y A T S R D V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361
5f4 seq    W A A T N N M H I A N M S L G S D A P S T T L E R A V N Y A T S Q G V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361
9e3 seq    W A G N N G M H I A N M S L G T S A P S A T L E Q A V N A A T S R G V L V I A A S G N G A G S V G Y P A R Y A N A M A V G A T D 361
1c4 seq    W A A A N N M H I A N M S L G S D F P S T L E R A V N Y A T S Q G V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361
8c2 seq    W A A A N N M H I A N M S L G S D A P S T T L K R A V N Y A T S Q G V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361
8h2 seq    W A A T N N M H I A N M S L G S D F P S T L E R A V N Y A T S Q G V L V I A A T G N N G S G S V G Y P A R Y A N A M A V G A T D 361

Savinase seq  W A G N N G M H V A N L S L G S P S P S A T L E Q A V N S A T S R G V L V V A A S G N S G A G S I S Y P A R Y A N A M A V G A T D 388
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FIG 2H

Subtilisin Structure–Function Correlation

Activity in DMF Motifs

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                    140        150        160        170        180        190
Majority    QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGVAALVKQKNPSWSNVK

3d11 seq    QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK          523
2b8 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGVAALVK          523
2b4 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGVAALVK          523
2g6 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRY[V][SM]NGTSMATPHVAGVAALVK       523
3g9 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGVAALVK          523
5f4 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYARLNGTSMATPHVAGVAALVK          523
9e3 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRY[V][SM]NGTSMATPHVAGVAALVK       523
1c4 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK          523
8c2 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK          523
8h2 seq     QNNRRANFSQYGTGIDIVAPGVNVQSTYPGNRYASLNGTSMATPHVAGAAALVK          523

Savinase seq QNNRRASFSQYGAGLDIVAPGVNVQSTYPGSTYASLNGTSMATPHVAGAAALVKQKNPSWSNVK  590
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FIG 21